

LIV. *The Case of a Man, whose Heart was found enlarged to a very uncommon Size, by Mr. Richard Pulteney: Communicated by W. Watson, M. D. R. S. S.*

Read Dec. 17, 1761. **T**HOMAS C. aged about thirty-two or thirty-three years, had the rickets in his infancy, and continued very weakly for several years after. In the winter of the year 1759, upon taking cold, he was afflicted with peripneumonic and pleuritic symptoms; which had scarcely left him, when he was seized in the summer of the year 1760, after great exercise in walking, with a fever, and very violent rheumatism: this, after affecting most of his joints, remained the longest and most troublesome in his knees. When he was somewhat better of his rheumatism, but before the pain and stiffness of his joints had left him, he was advised to go into the cold bath: he did so; but, upon coming out again, instantly felt such an increased load, fainting, and anxiety about the præcordia, that he thought he should scarcely have recovered the shock it gave him: nevertheless, he ventured in again a day or two after; but experienced the former symptoms, in an aggravated degree; and from this time dated the disorder which terminated his life. A palpitation of the heart, to which he had been subject for some years before, became now much stronger, and gradually increased with his other complaints, to a very great degree. His rheumatism continued to affect his breast, and all his joints, particularly his knees; especially, upon
taking

taking cold, or any irregularity in the non-naturals, he became weaker, breathed shorter, especially upon walking a little, or talking rather more or higher than usual, any of which exertions put him out of breath presently.

When he first applied to me, in the beginning of March 1761, I found him labouring under the above-mentioned complaints; and upon examining his pulse, found it soft, and extremely quick: it commonly went at the rate of 110 in the morning, and in the evening 120, pulsations in a minute, as I repeatedly observed. The palpitation of the heart struck me instantly, as it shook his whole body at every stroke. I could never observe any inequality of the intermittent kind in the pulse, under any the most accelerated motion thereof, or in whatsoever situation the body was placed.

At this time the chylipoietic organs were all tolerably good. Stimulating food, or fermented liquors, had, for some time, always increased his anxiety and load upon his breast, and this experience had induced him to refrain from them.

He had slept very ill for several months, sometimes not more than an hour or two during the whole course of the night. He could not sleep on the left side at all, and was always easiest in an erect posture. He was commonly awaked with a sense of suffocation, from the vast load and oppression upon his breast, and from the strength of the palpitation.

From his first application to me, I had no hopes of doing him any real service, as I thought it evident, from his complaints, and particularly from the great and uninterrupted palpitation, and the feel of the

pulse, that there was something very extraordinarily disordered in the heart itself, or in some of the large vessels near it. The regularity of the pulse inclined me to suppose an aneurism, rather than polypose affections. All this time, however, no outward appearance strengthened this supposition.

No remedies alleviated his complaints in any degree, except bleeding, which afforded a relief; but very temporary, and weakened him too much to be repeated more than once. All that it seemed to do for him was the procuring him rather more sleep the night after, than he usually had, and easing a little tickling cough which had remained with him, ever since the year 1759, at times; and particularly since his rheumatism, but which was never very troublesome.

Soon after I first saw him his legs became œdematous, and by the beginning of April his thighs were much enlarged, and at length his belly in some degree. At this time he began to cough more from having taken cold, inadvertently as he thought, but he soon expectorated freely. By the middle of April he was too weak to sit up, nor could he speak or stir without being ready to expire for want of breath. On the night of the 20th of April, as he was coughing an hæmoptœe suffocated him instantly.

About two quarts of a thin coffee-coloured liquor were found in the cavity of the abdomen. The omentum was very small, perhaps it would not weigh more than two ounces. The stomach and intestines were greatly inflated. In all other respects, the viscera of this cavity, as far as an hasty examination would permit us to observe, were in a sound state.

In the thorax we found the lungs very found, but extremely turgid with blood: they adhered very firmly to the pleura on both sides, and particularly on the left, where the adhesion was almost total. The heart, as might be expected, appeared to be the organ principally affected. The pericardium adhered almost every-where so close, as to form, as it were, the external coat thereof. The heart itself was of an enormous size, and of a very pale colour, and loose and flaccid in its texture, to a very remarkable degree. As far as I could judge, from the most careful examination and comparison, I could not find that either of the auricles or ventricles bore an extraordinary proportion to the other. The whole heart might be said to be entirely aneurismatical. The parietes were every-where thin, in proportion to the size of the whole. There was no particular enlargement of the aorta, as far as I traced it, which I did to some distance; but its texture, as that of the heart, was very lax and flabby. I could not find the least polypose concretions in any part whatsoever. When the heart was cut short from the great vessels, emptied of the coagula, and washed as clean as possible, it weighed upwards of twenty-eight ounces avoirdupois weight.

OBSERVATIONS.

The size of the human heart, in a natural state, is known to differ greatly in different subjects. Dissections prove this beyond all controversy, and it is usually supposed, that the capacity of the blood-vessels bears a general proportion to the size and capacity of the

the heart itself (1). Very few anatomists, in describing this organ, have estimated its size by its weight. Dr. Haller (2), where he treats so amply and professedly upon the heart, does not, from his own knowledge, mention its weight. From Tabor, he says, it is estimated at ten ounces; but this is supposed to be when freed from the auricles, as well as the extremities of the larger vessels. Its mean weight by some other anatomists is reckoned at thirteen ounces.

Aneurisms of the heart, both with and without polypose concretions, are not unfrequent; many instances occur in the writers of observations. Dr. Douglas (3) saw a young man, who died of a palpitation of the heart, the left ventricle of which was found three times larger than the right. This case bears a considerable analogy to the instance before us; and is quoted, among several others, by the Baron Van Swieten, in treating upon aneurisms of the heart (4). The baron also relates a case from Lancisi, in which the left ventricle was twice as large as the right; and the whole heart weighed two pounds and an half. Hoffman, in his systema, when treating upon the palpitation of the heart, gives us a case, where the heart was greatly distended; but he does not ascertain to what degree, by any method whatever: he only says, *cor miræ fuit magnitudinis* (5).

(1) Hoffman. Opera omnia, Tom. I. lib. i. cap. vi. De Sanguinis Circuitu. Suppl. II. Part. iii. p. 65. Hist. Corp. Human. Anatom. § 641.

(2) Element. Physiolog. Vol. I. p. 326.

(3) Phil. Trans. abridged by Jones, Vol. V. p. 229.

(4) Comment. in Aphor. Vol. I. ad sect. 176.

(5) Opera omnia, Tom. III. p. 92.

De Haen, in his *Ratio Medendi* (6), tells us, he was present at the opening of a man, whose heart was three times bigger, at least, than in its natural state. The dilatation was in its left ventricle, which was so thin as to resemble a whitish membrane only; and the heart was broader at its apex than at its base.

De Haen likewise, in his *ratio Medendi* (7), informs us, that the heart of a woman, who died of a fever, with extreme debility, weighed twenty-four ounces, even after it was washed, and wiped very dry. This increased weight and magnitude arose more particularly from the left ventricle. The extension of ventricles was so great, that they both together contained more than a quart. Though this woman was no more than thirty-seven years of age, the aorta at its base was degenerated into bone, and was four inches in circumference. Besides the whole portion of the aorta at its base being ossified, there were interspersed in several parts of its length, what our author calls *insulae ossæ*. In one, who lived so long as the excellent Wepfer, such appearances are not extraordinary; but in one so little advanced as the woman in question, these ossifications are very unusual.

It would be endless to quote instances of the preternatural dilatation of this organ: to name no more, we have a very recent and striking one of this kind, in the body of our late Most Gracious Sovereign, whose sudden death was owing to the rupture of the right ventricle of the heart: a circumstance, which cannot be conceived to have taken place, without a

(6) Cap. xxx. De Aneurysmate.

(7) Pars sexta, p. 143.

previous gradual dilatation of the same, and that, probably, to a very considerable degree.

In cases of this kind, commonly one of the ventricles is found distended to a monstrous size, while the rest of the heart remains nearly in its natural state. It is but rare, perhaps, that the heart is seen so equally and universally enlarged, as in the case under consideration.

This man, I have observed, had the rickets, when a child: in this disorder, the whole system is found to be in a very lax debilitated state; and the heart is said to be so in particular. The constitutions of rickety children frequently amend as they grow up, and particularly about the age of puberty. But, in this case, I think we may safely conclude, that this man's heart never recovered its due tone, after he grew up. It is scarcely to be supposed, that the heart could suffer so great an enlargement during the last year or two of his life only: the more so, as I remember to have heard him say, that, for many years before his death, a very little exercise put him out of breath. Doubtless it was increased greatly during the latter years of his life, by his business, which obliged him to exercise much, particularly in walking; so that before he got his rheumatism, he came home so weak, and so much fatigued with his usual day's exercise, that he has been almost unable to stir for a day or two. We may add to this, the increased force that the heart sustained during the time he laboured under his inflammatory disorders, both before and after his rheumatism seized him.

The great increase of his disorder, upon going into the cold bath, is not surprizing. The shock of the cold

cold water, and the resistance necessarily given, by that means, to the circulation, must occasion a vast surcharge of blood in the auricles and ventricles of the heart, already too weak to perform its office with sufficient power. Besides the impropriety of such a step, while there was reason to think, that the inflammatory spissitude of the blood was by no means overcome, the preternatural distention was doubtless increased by this means.

From hence, however, may be deduced an useful hint in practice; namely, where, from the state of the pulse, from a palpitation of the heart, a faint weak voice, an aptitude to fall into lipothymies from slight causes, or from the concurrence of any other symptoms, we have reason to suspect, that the heart is too weak; in such cases, not to direct cold bathing, until the patient has been prepared for it, by going into water between the degrees of tepid and quite cold water; nay, probably, it might be better to wait, before cold bathing be prescribed at all, till the effect of medicines seems previously to have invigorated, in some degree, the cardiac system.

The considering the heart as a muscle capable, like all others, of great alteration respecting its tone; and, at the same time, that such alteration must essentially affect the whole animal œconomy, from the very great importance of the organ itself, is evidently of great use in medicine. It must assist us in accounting for several phænomena that occur in various disorders, which are utterly inexplicable by other means; and of consequence, must lead to a more successful practice. In nervous disorders, and in Fevers of the putrid malignant kind for instance, we find the heart so
extraordinarily

extraordinarily weakened, that it is in many instances dangerous to subject the patient to an erect posture, even though it be but for a very little time (8). Syncope and even fatal deliquia and comatose affections have been the consequence. In scurvies too where the whole system is become very lax and tender, and has lost much of its tonic and vital elasticity, the same phenomena have occurred (9). In these cases the necessity of the horizontal, or at least the recumbent posture, is manifest; as it is obvious how much more force is requisite to throw the blood up into the head in an erect than in an horizontal position.

It is probable that the extreme weakness and slow recovery of some women, particularly such as are of a delicate constitution, after a hard labour depends often upon the weakness of the heart, occasioned by the force it sustained during the throws of labour. In these cases, though rest is among the first methods of recovery, yet I think I have observed the use of the quinquina to be attended with good success.

To conclude, it is probable that cases of this kind occur much oftener than we are aware of; as, doubtless, the dissection of morbid bodies, were that but more frequently allowed of, would teach us. There is room to think, that this is the case, though not in the degree of the instance before us, in almost all diseases arising from a weak and lax fibre. Cheselden tells us, in his Anatomy, that in persons "that died of a dropsy, he always observed the heart large, its

(8) Vide Hoffman. Opera, Tom. II, p. 72. Tom. VI. p. 169. De Situ erecto in Morbis periculosis valde noxio.

(9) Engalen. De Scorbuto, p. 226. et passim.

" fibres

“ fibres lax, and the vessels about it immoderately
“ distended.”

Aristotle (10) expressly says, that timid people, and those of cold constitutions, have large hearts; on the contrary, that the bold, and those of a warm temperament, have small ones. Nor does this opinion of that excellent philosopher seem ill founded; as women, children, and weakly men, from whom much courage is not looked for, are lax-fibred, and, consequently, more liable to an enlargement of this organ, than those of the human species, who are robust and tense fibred, from whom a manly exertion of courage is more to be expected.

LV. *An Account of several Experiments in Electricity: In a Letter to Mr. Benjamin Wilson, F. R. S. By Edward Delaval, Esq; F. R. S.*

S I R, Old Palace-yard, June 8, 1761.

Read Dec. 17, 1761. **I**T appears by the experiments mentioned in my letter to you, published in the fifty-first volume of the Philosophical Transactions, that stones, and other earthy substances, are convertible by several methods, and particularly by different degrees of heat, from non-electrics into electrics.

(10) Lib. iii. De Partib. Animal. cap. iv.

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